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Review Article

A REVIEW ON THE ANTI-DIABETIC (*PRAMEHAHARA*) ACTION OF AN AYURVEDIC POLYHERBAL FORMULATION -*NISAKATAKADI KWATHA*

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ABSTRACT

Type 2 Diabetes mellitus is one of the major diseases affecting the population worldwide. India is no exception with its 69. 1 million people affected as per current statistics. So in the current scenario, search for effective anti diabetic drugs are on the rise. The management of diabetes with modern system of medicine, inspite of many advances still remains unsatisfactory. This led to the search of safe, effective and cheaper herbal remedies. Such remedies can be explored from the huge wealth of Ayurveda which has been practice in India since centuries. One such effective anti diabetic Ayurvedic formulation that has been in use in Kerala by traditional vaidyas since long ago is *Nisakatakadi kwatha*. It is mentioned in one of the traditional *Malayalam* text, *Sahasrayoga*. It is a formulation consisting of 8 drugs viz. *Nisa, Kataka, Amalaki, Paranthi, Lodhra, Bhadrika, Saptachakra* and *Ushira*. In this review an attempt has been made to analyse the anti diabetic (*Pramehahara)* action of this formulation by reviewing the pharmacological properties and the recent research updates on each of these 8 drugs by reviewing textbooks of Ayurveda and journal articles. This review also aims to familiarize this effective formulation to the Ayurvedic fraternity and to the general public.

KEYWORDS: *Nisakatakadi kwatha*, *Pramehahara,* anti diabetic action, Polyherbal formulation.

INTRODUCTION

Lifestyle diseases or non-communicable diseases (NCDs) are on rise in present scenario due to altered lifestyle and adoption of western culture along with physical inactivity and unhealthy dietary practises. Four types of NCDs-cardiovascular diseases, cancer, chronic respiratory diseases and diabetes make the largest contribution to morbidity and mortality due to NCDs. Major metabolic risk factors are obesity, raised blood pressure, raised blood glucose and raised total cholesterol levels. [1]

Type 2 Diabetes mellitus (DM) is one among the major lifestyle diseases that greatly affects people worldwide. Till date no cure has been successfully found to eliminate the disease completely. A strict diet along with proper medication and regular monitoring of blood sugar are the key to the management of DM. Classic symptoms of DM include polyuria, polyphagia and polydypsia. Associated symptoms include fatigue, weight loss, tingling, pain or numbness in the hands/feet, burning sensation on hands and feet and pruritus. Uncontrolled DM can result in complications like diabetic retinopathy, diabetic nephropathy and diabetic neuropathy.

In Ayurveda, DM may be correlated to *Prameha* which is characterised by excessive urination. *Prameha* occurs due to intake of unwholesome food and due to engaging in unwholesome activities that vitiates *Kapha dosha*. This vitiated *Kapha dosha* in turn vitiates the *Medo dhatu.* Finally vitiated *Kapha dosha* and *Medo dhatu* combines with S*sareera kleda* and the vitiated *Dosha dooshyas* get eliminated as urine through the urinary passage.

The aim of management of *Prameha* is to bring about the equilibrium of the *Dosha* and to facilitate the normal functioning of *Dhatus* and *Malas*. *Langhana* should be adopted in general as it is a *Santharpanodha vyadhi*. *Sodhana* (elimination) therapy should be adopted in patients who are healthy or in whom *Doshas* are markedly vitiated. On the other hand, if the patient does not have sufficient *Bala* (strength) to undergo *Shodhana* therapy or when *Doshas* are moderately vitiated, *Samana* (pacification) therapy can be adopted.

In *Samana* therapy, various *Kwathas, Asavas* etc are advised. One such effective formulation is *Nisakatakadi kwatha*.

MATERIALS AND METHODS

This article aimed to review the *Pramehahara* property of an Ayurvedic polyherbal formulation, *Nisakatakadi kwatha.* The study was done by referring various Ayurvedic textbooks and

by reviewing various research articles on antidiabetic activity of individual ingredients of this decoction. The results thus obtained are presented below.

RESULTS AND DISCUSSION

Nisakatakadi kwatha is an effective anti diabetic formulation that has been in use in Kerala since long ago. It is mentioned in one of the traditional *Malayalam* texts, *Sahasrayoga.*[2]

Table 1: Ingredients of *Nisakatakadi kwatha*

Sl. No	Ingredients	Botanical Name	Family
1.	*Nisa*	*Curcuma longa* Linn.	Zingiberaceae
2.	*Kataka*	*Strychnos potatorum* Linn.	Loganiaceae
3.	*Nellikka (Amalaki*)	*Emblica officinalis* Gareth.	Euphorbiaceae
4.	*Thechi (Paranthi)*	*Ixora coccinea* Linn.	Rubiaceae
5.	*Pachotti (Lodhra)*	*Symplocos cochinchinensis* (Lour.) S. Moore ssp. laurina	Symplocaceae
6.	*Bhadrika*	*Aerva lanata* Juss.	Amaranthaceae
7.	*Ekanayakam (Saptachakra)*	*Salacia reticulata* Wight	Hippocrateaceae
8.	*Ramacham (Ushira)*	*Vetiveria zizanioides* L. N.	Poaceae

Table 2: Chemical Constituents of Ingredients of Nisakatakadi kwatha

Sl. No.	Ingredient	Chemical Constituent
1.	*Curcuma longa* Linn.	Curcumin
2.	*Strychnos potatorum* Linn.	Diaboline, brucine, loganin, β-sitosterol
3.	*Emblica officinalis* Gareth.	Ascorbic acid, ellagic acid, gallic acid, chromium, zinc
4.	*Ixora coccinea* Linn.	Ursolic acid, oleanolic acid, lupeol, rutin, kaempferol
5.	*Symplocos cochinchinensis* (Lour.) S. Moore *ssp. laurina*	β-sitosterol, phloretin 2' glucoside, oleanolic acid
6.	*Aerva lanata* Juss.	β-sitosterol, α-amyrin, betulin, hentriacontane
7.	*Salacia reticulata* Wight	Salacinol, katnanol, mangiferin
8.	*Vetiveria zizanioides* L. N.	Khusimol, vetivone, vetiverol

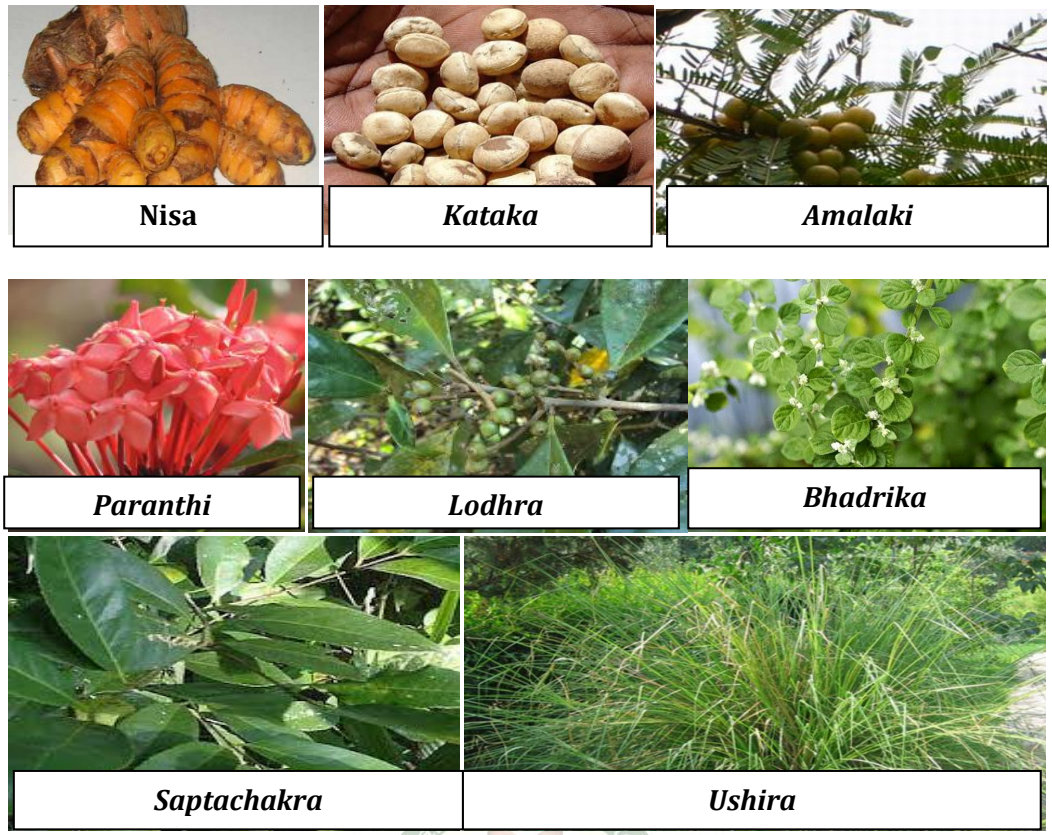
Table 3:Pharmacological Properties of Ingredients of *Nisakatakadi Kwatha*

S. No	Ingredient	Rasa	Guna	Veerya	Vipaka	Karma
1.	*Curcuma longa* Linn.	*Katu, Tiktha*	*Laghu, Ruksha*	*Usna*	*Katu*	*Kapha pittasamaka, Kushtaghna, Kandughna* [3]
2.	*Strychnos potatorum* Linn.	*Madhura, Tiktha, Kashaya*	*Guru, Visada*	*Seeta*	*Madhura*	*Vata kaphahara, Chakshushya*[4]
3.	*Emblica officinalis* Gareth.	*Kashaya, Katu, Tiktha, Amla, Madhura*	*Laghu, Ruksha, Sara*	*Seeta*	*Madhura*	*Tridosasamaka Rasayana, Chakshushya*[3]
4.	*Ixora coccinea* Linn.	*Kashaya, Tiktha*	*Laghu*	*Seeta*	*Katu*	*Pittasamaka*
5.	*Symplocos cochinchinensis* (Lour.) S. Moore *ssp. laurina*	*Kashaya*	*Ruksha*	*Seeta*	*Katu*	*Pittakapha samaka*

6.	*Aerva lanata* Juss.	*Tiktha, Kashaya*	*Laghu, Teekshna*	*Usna*	*Katu*	*Kaphavata Samaka*[4]
7.	*Salacia reticulata* Wight	*Kashaya, tiktha*	*Laghu, Ruksha, Teekshna*	*Usna*	*Katu*	*Kaphapittahara, Mutrasangrahaneeya, Madhumehahara Anulomana*
8.	*Vetiveria zizanioides* L. N.	*Tiktha, Madhura*	*Laghu, Ruksha*	*Seeta*	*Katu*	*Vatapittahara, Daha prasamana* [3]

Table 4: Research works done on ingredients of *Nisakatakadi kwatha*

S. No	Ingredient	Activity studied	Extract Used	Animal model/ Cell line/ Clinical Study
1.	*Curcuma longa* Linn.	Anti diabetic activity - preventing pancreatic injury and reverses elevated serum amylase values	Aqueous extract	Mouse myoblast cell[3]
2.	*Strychnos potatorum* Linn.	Anti diabetic activity-Potentiating plasma insulin effect either by increasing pancreatic secretion of insulin or by increasing the release of insulin from its bound form	Ethanolic extract	Streptozotocin-nicotinamide induced animal model[5]
3.	*Emblica officinalis* Gareth.	Hypoglycemic and anti diabetic activity-Increasing serum insulin levels and by lowering serum glucose levels	Aqueous extract	STZ induced type 2 diabetes model[6]
4.	*Ixora coccinea* Linn.	Hypoglycemic and hypolipidemic activity –Enhanced secretion of insulin from pancreatic β-cell and by increased tissue uptake of glucose by the enhancement of insulin sensitivity	Aqueous extract	Alloxan induced diabetic rats[7]
5.	*Symplocos cochinchinensis* (Lour.) S. Moore ssp. laurina	Anti diabetic activity – Inhibition of α-glucosidase and enhanced insulin sensitivity	Hexane extract	STZ induced Type 2 diabetic rats[8]
6.	*Aerva lanata* Juss.	Anti diabetic activity – Due to high phenol content, anti oxidant activity and free radical scavenging ability	Hydroethanolic extract	Alloxan induced diabetic rats[9]
7.	*Salacia reticulata* Wight	Anti hyperglycemic activity – Modulating multiple targets that influence carbohydrate and lipid metabolism like α-glucosidase, pancreatic lipase, glucose transporter 4 mediated glucose uptake	Aqueous extract	Clinical study[10]
8.	*Vetiveria zizanioides* L. N.	Antihyperglycemic activity	Ethanolic extract	Alloxan induced diabetic rats[11]



DISCUSSION

Saptachakra (*Salacia reticulata* Wight) is *Kashaya, Tiktha* in *Rasa*. *Tiktha rasa* is *Mutropashoshana* (results in reducing urinary output) in nature. Thus it helps in reducing polyuria, one of the major symptom of DM and in fact the most troubling one for patients.

Kataka (*Strychnos potatorum* Linn.) is *Madhura* in *Rasa*, has *Guru guna* and is *Madhura* in *Vipaka*. All these properties helps in reducing polyphagia experienced by DM patients.

Paranthi (*Ixora coccinea* Linn.) has *Kashaya, Tiktha rasa* and is *Seeta virya* in nature. This helps in *Pitta samana* and in reducing the burning sensation of hands and feet experienced by DM patients.

Ushir a (*Vetiveria zizanioides* L. N.) has *Tiktha rasa* and is *Seeta virya* in nature. Thus *Ushira* also helps in *Pitta samana* and in reducing the burning sensation of hands and feet experienced by DM patients.

Haridra (*Curcuma longa* Linn.) through its *Kaphapitta samaka* property, *kushtaghna* and *kandughna karmas* acts effectively in pruritus experienced by diabetic patients.

Amalaki (Emblica officinalis Gareth.) being a *Rasayana dravya* gives protection to all vital organs and helps in preventing or delaying complications like diabetic retinopathy, diabetic nephropathy and diabetic neuropathy.

Amalaki (*Emblica officinalis* Gareth.), *Lodhra* (*Symplocos cochinchinensis* (Lour.) S. Moore *ssp. laurina)* and *Kataka* (*Strychnos potatorum* Linn.) are *Chakshushya* in nature. This is especially beneficial in preventing or delaying diabetic retinopathy.

CONCLUSION

Nisakatakadi kwatha is an effective *Samana yoga* (formulation) widely used in the management of *Prameha* as the individual drugs of this formulation is *Pramehahara* (anti diabetic) due to their pharmacological properties, chemical constituents and based on modern in-vitro and in-vivo studies. In clinical experience, it is found to be highly effective in relieving symptoms like constipation, polyuria and fatigue.

So *Nisakatakadi kwatha* should be promoted as a potent anti-diabetic formulation so that the public get benefited.

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